bearing upon the evolution of the genus Cypripedium," in which he noted the discovery of a *Cypripedium* with an almost perfectly regular flower, and from its structure called attention to the probable morphology of the normally modified parts.

15. DR. W. G. FARLOW spoke upon "Some Algæ found in water supplies," in which an interesting account was given of the author's investigation of the water supply of Boston, the Nostocs with "cucumber taste" and those with "pig-pen odor," the dangers to be anticipated in using water from any lakes in general, and Minnesota lakes in particular, and the care necessary to avoid them. Incidental reference was also made to Prof. Arthur's discovery of *Rivularia fluitans* the year before.

16. DR. W. G. FARLOW also spoke upon "Certain parasitic Fungi," being an account of some of the most injurious species of the genus *Peronospora*.

17. C. RICHARDSON read before the Chemical Section a paper upon "Sotol, a Mexican forage plant." The plant in question is *Dasylirion Texanum*, and is used as a forage plant in Texas, sheep becoming very fond of it, and when using it can do without water for several weeks. A plain covered with it was described as looking like a field of cabbages.

It will be seen by this hasty summary that botany was well represented at Minneapolis, and it is the expectation that Philadelphia will witness a far greater gathering of botanists and botanical papers.—J. M. C.

GENERAL NOTES.

Aquilegia longissima is the name (for which, I believe, I am responsible) of a species discovered by Dr. Palmer, in Northern Mexico, and distributed in his collection. From Dr. Palmer's seeds plants were raised in the Botanic Garden here, and probably elsewhere. Its first blossoming seemed to be out of season, and abnormal; but it is now blossoming well, and if by no means the handsomest species of the genus, is the most extraordinary. It is just coming into blossom now, in the latter days of July, when its relative, *A. chrysantha*, has passed its prime. The spurs (from which it gets its name) are as much longer than those of *A. chrysantha* and *A. cærulea* as those are of the old-fashioned species. They are four inches long, and slender-filiform, even quite to their origin. The limb of the petals, which in *A. chrysantha* often nearly equals the sepals, and inclines to spread, is in this species about as widely spreading and almost as long as the narrower (lanceolate) sepals, elongated-spatulate in form, the orifice of the spur at its base, abrupt and barely a line in diameter. The flower, as in its relative, is erect or a little inclined; the straight spurs, with a manifest nectariferous knob at base. One would like to know what Lepidopterous insect it is that drains it.—A. GRAY.

Some Rhode Island Notes.—I have long been interested in local names of plants. Here are some Rhode Island names. Here, in Warwich, the *Celtis occidentalis* has the name of "Mining berry." *Hypericum Sarothra* is called "Louseweed," because the seed-pods crack between the fingers in a rather suggestive manner. In South Kingston I am told that the country people have corrupted *Rhododendron* into "Witch-of-Endor," showing what sound will do for philology.

I find ants visiting the cup-shaped glands at the bases of the leaves of *Cassia Chamæcrista*, which are nectar-secreting. Is there any reciprocal benefit?

W. W. BAILEY.

Mitella diphylla.—The flowers of *Mitella diphylla* are almost at right angles to the scape, and are arranged on the $\frac{2}{5}$ plan. But the fruiting specimens have a cup-shaped pod, which is always perfectly erect, bearing in its open cavity the seeds. In order to assume this erect position, since all the scapes are more or less slanting, the fleshy pedicels must take a one-sided arrangement, and on horizontal scapes this twisting of the pedicels places the pods again at right angles to the scape.—AUG. F. FOERSTE, *Dayton, O.*

Botanists and Botanizing at Minneapolis.—The meeting of the A. A. A. S. proved, as had been hoped it would, the largest and most interesting in the history of the Association in respect to the number and standing of the botanists in attendance, and the number and importance of the botanical papers presented. In truth, botany, for the first time took the lead in the biological section. If the reason be sought for this awakening of a long neglected interest it is found without difficulty. The botanical journals have had much to say during the last year about the richness of the flora in Minneapolis and vicinity. The knowledge of this fact was scarcely due to the kindling zeal of local collectors, for Minnesota possesses but a few workers, and these exchange or distribute little material, but is directly traceable to the Summer School of Science, founded by the University in 1881, and which has increased in interest and attendance each season since.

A distinctive feature of the botany given at this school has been the study of plants irrespective of the value of their classificatory characters, the illustrative examples being selected from all grades of vegetation, from the simplest unicellular seaweed to the most highly differentiated composite. The laboratory is the all-important adjunct of such a course, and in this instance the supply of material for it came entirely from the fields as it could be found by the instructor, or was brought in by the pupils. This scouring of highways and byways for all manner of vegetable growths led to a recognizance of the abundant occurrence of interesting plants, a discovery that attracted attention in other parts of the country, and resulted in a widespread desire to see and profit by it. The liberal policy of the College of Agriculture, in considering and following up with an investigation the reported poisoning of cattle by drinking lake scums directed special attention to the flora of the lakes. Couple these facts with the conviction, that had almost become general, that one would be likely to meet a large number of his fellow laborers at Minneap-

olis and enjoy the quickening influence of the exchange of opinions, and of social intercourse, and the increased attendance is accounted for.

A strong attempt was made to have excursions for the particular benefit of the botanists, but owing to the difficulty of learning the plans of the local committee in time to make corresponding arrangements, and duly notify those interested, the attendance upon such as were arranged was small, much to the regret of all concerned. Those who were so fortunate as to go, both specialists and general collectors, were enthusiastic over their success in obtaining desirable specimens.

This experience in conserving the interests of botanical members led to the conviction that to insure the best results there should be well-matured plans developed before the Association convenes, and which should be so arranged as not to conflict with other excursions or exercises. A committee was accordingly appointed to attend to the matter for the Philadelphia gathering of next year, when we may expect still larger attendance and more profitable herborizing.—J. C. A.

Chlorophyll corpuscles and Pigment bodies.—Every student of plant histology knows how impossible it is often to speak definitely with regard to cell contents. Attempts have been made to classify them, but only in well marked cases are they satisfactory. When any system finds its best exemplification only in exceptional cases it is time to look for another. Schimper, at Bonn, and Meyer, at Strassburg, have been working independently at certain phases of this problem, and have reached a more resonable conclusion than has ever been heretofore advanced. It looks as though the principal contents of cells, as varied as they appear, all have a common origin, that starch-formers, chlorophyll corpuscles and pigment bodies are related forms, sometimes even interchangeable, and are not produced in the protoplasm of the cell. This last statement is a regular iconoclast, for if we have ever taught anything with confidence about cell contents, it has been that we would have to look to protoplasm as the originator of most of them, that a chlorophyll corpuscle was nothing but colored protoplasm, that starch-formers were in some mysterious way born in protoplasm and chlorophyll, etc. But now those nameless little floating bodies, specks, needles, rods, etc., to which we have called no special attention, are all these things in various stages of formation, are called *plastidia* or *plastids*, and have existed from the very first in the plant, in the embryo itself, even in the embryo-sac and oösphere. Of course they are protoplasmic, are always present in meristems, and by the continuous growth and division of a few primitive *plastidia* the whole plant is supplied. This reduces the nomenclature of cell contents to a more uniform basis, but of course this common origin allows names to be applied rather to marked phases than to things which are specifically distinct, and allows every intermediate stage. Thus *leukoplasts* normally come from colorless *plastidia* in deep-seated cells, or may be from *chloroplasts*, or may under the action of light become *chloroplasts*, or may act as Schimper's *Stärkebildner*. *Chloroplasts* (chlorophyll copuscles) come normally from *plastidia* which are originally green, but they may come from *leukoplasts* exposed to the light, and often become *chromoplasts* (the pigment bodies). *Chrom-*

oplasts occur of all shades from carmine-red to greenish-yellow, but never blue. And so with chlorophyll corpuscles, pigment bodies, starch-formers and sundry other substances closely related, we may hope that we are approaching a natural classification of cell contents.—J. M. C.

The Genera Plantarum.—In the September *Am. Jour. Sci.* Dr. Gray reprints from the *Nation* a notice of the completion of Bentham and Hooker's *Genera Plantarum.* Begun in 1862 and finished this year, it stands as the second great botanical work of the century, the "Prodromus" of De Candolle being the other. Dr. Gray compares the various "Genera Plantarum" which have been published in the following interesting way:

"Some idea of the progressive enlargement of the field may be had by a comparison of the number of genera characterized in these successive works. The phænogamous genera of

Linnæus, "Gen. Pl.,"	ed. 1,	A. D. 1737,	were.....	887
" "	ed. 6,	A. D. 1764,	"	1189
Jussieu, "		A. D. 1789,	"	1707
Endlicher, "		A. D. 1843,	" (about).....	6400
Bentham & Hooker,		A. D. 1883,	"	7585

If the last had been elaborated upon the scale of Endlicher, or with the idea of genera which is still common if not prevalent, the number of genera would have amounted to at least ten thousand. An estimate of the number of known species of each genus and higher group has been made throughout the work—a rough approximation only, mentioning first the number in the books, and the number to which, in the opinion of the authors, these may probably be reduced by the botanists who adhere to the Linnæan view of species; from which it appears that, upon the very strictest estimate, their number, as now known to botanists, is at least 95,620. In round numbers, it may fairly be said that about 100,000 species of phænogamous plants are in the hands of botanists. The five largest orders, as well for genera as for species, are the following, and in this rank: Compositæ, Leguminosæ, Orchideæ, Rubiaceæ, Gramineæ. The high standing of the orchid family in the list will be a surprise to many. Linnæus knew only a hundred species; five thousand is now a moderate estimate —about half as many as there are of Compositæ, which hold to their proportion of one-tenth of the whole. In both families every country and district is largely peculiar in its species and types. The far greater prominence of Compositæ over orchids is owing to the vast number of individuals in the former, and their paucity in the latter."

Injurious Parasitic Plants.—It has become the fashion in certain quarters to decry the work done by the Department of Agriculture, but this is by no means politic or kind. The department is blessed with a maximum amount of ambition and a minimum amount of money, and it is hard to see how it could do more. Much good work has already been done, work that has yielded abundant returns in the better cultivation and preservation of various crops. C. V. Riley, in charge of the Entomological Commission, has well investigated the haunts and habits of various noxious insects, and the cost of these investigations has been but a trifle when compared with the damage to crops that has

been prevented. Such a work shows a very wise and far-sighted policy, and undertaken, as it has been, in the true scientific spirit, it has satisfied not only those immediately benefited, but entomologists as well. It is the densest stupidity which refuses the expenditure of hundreds to save thousands, or which looks for immediate practical results from the first appropriation. "Learn to labor and to wait" is not a part of the average legislator's policy, to whose mind results must be immediate or they are nothing. Now in the midst of all this good work that is being done by the department, and that has been so wisely provided for, why is it not seen that another great work is waiting to be done, a work that can not be entered upon too quickly? Noxious insects are not the only destroyers of crops, but hosts of injurious parasitic plants are spreading everywhere. We venture to say that loss from this source is as great as from insects. The habits of these injurious parasites have not been studied much in this country, but there are competent men who are working at them in a private way, but this is slow business when the country is in need. The rusts and smuts, and molds and rots, all need studying, and there could be no wiser appropriation of public money than to organize a commission for such investigation on the same basis as the Entomological Commission. The Department of Agriculture should make the move in this matter, and urge upon the next Congress the necessities of the case, backed by all the scientific and agricultural journals of the country. A laboratory for such investigations can be fitted up with very little outlay, and with unlimited opportunity for observing these parasites over large areas the results would undoubtedly be most satisfactory. There is some way of getting rid of these pests, and it can only be found by a careful study of their life histories. Usually they pass through different phases upon different hosts, and these hosts may sometimes be necessary to their further development. If then some host plant, which may be of no economic value, is acting as a carrier of these destructive parasites to some valuable crop, what incalculable importance it would be to know it! This is but the vaguest kind of intimation as to the direction in which practical results might speedily be reached. A commission for the study of injurious parasitic plants should now be the ambition not only of the Department of Agriculture, but of every botanist and agriculturist in the country.—J. M. C.

EDITORIAL NOTES.

PROFESSOR COULTER gave an account of the development of the dandelion flower before the A. A. A. S. at Minneapolis. His conclusions were: I. The inferior ovary is produced by an arrest in the development of the floral axis, the rising in a peripheral ring of the floral organs, and the gradual arching over of the cavity thus produced by the carpellary leaves; II. The syngenesious anthers are united by contact and pressure, but in no sense structurally; III. The ovule is not produced directly from the axis, but is an outgrowth from the surface (probably the mid rib) of a carpellary leaf. The paper opened up a number of incidental questions of much interest. It will appear shortly in the *American Naturalist*.